IN THE CLAIMS:

1. (currently amended) A rechargeable lithium battery including a negative electrode made by sintering a layer of a mixture of silicon particles and/or silicon alloy particles, which undergo a porosity increase that advances inside from particle surfaces during charge and discharge, and a binder on a surface of a conductive metal foil current collector, a positive electrode and a nonaqueous electrolyte, characterized in that said nonaqueous electrolyte contains carbon dioxide dissolved therein in addition to carbon dioxide formed during fabrication of the battery and the increase in porosity of said silicon particles and/or silicon alloy particles during charge and discharge is suppressed.

2. (original) The rechargeable lithium battery as recited in claim 1, characterized in that said sintering is performed under a non-oxidizing atmosphere.

3. (currently amended) A rechargeable lithium battery including a negative electrode made by sintering, on a surface of a conductive metal foil current collector, a layer of a mixture of a binder and active material particles ~~having a tendency to~~ which undergo a porosity increase that advances inside from particle

surfaces during charge and discharge, a positive electrode and a nonaqueous electrolyte, characterized in that said nonaqueous electrolyte contains carbon dioxide dissolved therein in addition to carbon dioxide formed during fabrication of the battery and the increase in porosity of said silicon particles and/or silicon alloy particles during charge and discharge is suppressed.

4. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that the amount of added carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.001 % by weight.

5. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that the amount of added carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.01 % by weight.

6. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that the amount of added carbon dioxide dissolved in said nonaqueous electrolyte is at least 0.05 % by weight.

7. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that carbon dioxide is further contained in an inner space of the battery.

8. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said nonaqueous electrolyte contains a cyclic carbonate.

9. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said nonaqueous electrolyte contains a mixed solvent of a cyclic carbonate and a chain carbonate.

10. (previously presented) The rechargeable lithium battery as recited in claim 8, characterized in that said cyclic carbonate includes ethylene carbonate and/or propylene carbonate.

11. (previously presented) The rechargeable lithium battery as recited in claim 8, characterized in that said cyclic carbonate is ethylene carbonate.

12. (previously presented) The rechargeable lithium battery as recited in claim 8, characterized in that said cyclic carbonate is propylene carbonate.

13. (previously presented) The rechargeable lithium battery as recited in claim 9, characterized in that said chain carbonate includes at least one of dimethyl carbonate, diethyl carbonate and methyl ethyl carbonate.

14. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said nonaqueous electrolyte further contains a fluorine-containing compound.

15. (original) The rechargeable lithium battery as recited in claim 14, characterized in that said fluorine-containing compound is a fluorine-containing lithium salt.

16. (original) The rechargeable lithium battery as recited in claim 15, characterized in that said fluorine-containing lithium salt is $LiXF_y$ (wherein X is P, As, Sb, B, Bi, Al, Ga or In; y is 6 if X is P, As or Sb and y is 4 if X is B, Bi, Al, Ga or In) or

$LiN(C_mF_{2m+1}SO_2)(C_nF_{2n+1}SO_2)$ (wherein m and n are independently integers of 1 - 4).

17. (original) The rechargeable lithium battery as recited in claim 15, characterized in that said fluorine-containing lithium salt is at least one selected from $LiPF_6$, $LiBF_4$ and $LiN(C_2F_5SO_2)_2$.

18. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said active material particles have a mean particle diameter of 10 μm or below.

19. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said current collector has an arithmetic mean surface roughness Ra of at least 0.2 μm.

20. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said current collector comprises a copper foil, a copper alloy foil or a metal foil having a copper or copper alloy surface layer.

21. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said current collector

comprises an electrolytic copper foil, an electrolytic copper alloy foil or a metal foil having an electrolytic copper or copper alloy surface layer.

22. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said binder remains even after a heat treatment for the sintering.

23. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said binder comprises polyimide.

24. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that said active material particles are composed of silicon.

25. (previously presented) The rechargeable lithium battery as recited in claim 1, characterized in that an electric conductor is mixed in said mixture layer.

26. (original) A method for fabricating a rechargeable lithium battery including a negative electrode, a positive electrode and a nonaqueous electrolyte, characterized as comprising the steps of:

providing a layer of a mixture of active material particles containing silicon and/or a silicon alloy, which particles undergo a porosity increase that advances inside from particle surfaces during charge and discharge, and a binder on a surface of a conductive metal foil as a current collector and sintering the mixture layer while being placed on said surface of the conductive metal foil to prepare said negative electrode;

dissolving carbon dioxide in said nonaqueous electrolyte; and

assembling a rechargeable lithium battery using said negative electrode, positive electrode and nonaqueous electrolyte, wherein the increase in porosity of said silicon particles and/or silicon alloy particles during charge and discharge is suppressed.

27. (original) The method for fabricating a rechargeable lithium battery as recited in claim 26, characterized in that said sintering is performed under a non-oxidizing atmosphere.

28. (previously presented) The method for fabricating a rechargeable lithium battery as recited in claim 26, characterized in that the step of dissolving carbon dioxide in the nonaqueous electrolyte includes a step of blowing gaseous carbon dioxide into the nonaqueous electrolyte.

29. (previously presented) The method for fabricating a rechargeable lithium battery as recited in claim 26, characterized in that the step of assembling a rechargeable lithium battery includes a step of assembling a rechargeable lithium battery under the atmosphere including carbon dioxide.